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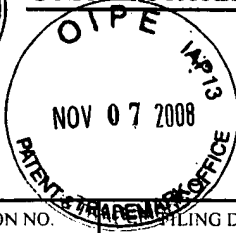
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,205	07/13/2006	Carlo Liberale	CCV/Dresser 030957 US (CM)	4778
64833 7590 10/31/2008 FLETCHER YODER (CAMERON INTERNATIONAL CORPORATION) P.O. BOX 1212 HOUSTON, TX 77251				
			EXAMINER SCHNEIDER, CRAIG M	
			ART UNIT 3753	PAPER NUMBER
			MAIL DATE 10/31/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/586,205	<b>Applicant(s)</b> LIBERALE ET AL.	
	<b>Examiner</b> CRAIG M. SCHNEIDER	<b>Art Unit</b> 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/13/06</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the submarine device of claim 1, the power supply lines associated with the controlled submarine device of claim 9, the flow control mechanism of claim 18, and the submerged flow control mechanism of claim 22 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

TITLE OF THE INVENTION.

CROSS-REFERENCE TO RELATED APPLICATIONS.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.

THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.

BACKGROUND OF THE INVENTION.

Field of the Invention.

Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

BRIEF SUMMARY OF THE INVENTION.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

DETAILED DESCRIPTION OF THE INVENTION.

CLAIM OR CLAIMS (commencing on a separate sheet).

ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

3. The disclosure is objected to because of the following informalities:

On page 1, line 10 "pluralità" should be --plurality--.

On page 1, line 12 "the transport" should be --that transport--.

On page 4, lines 19-23 the description for Figures 2 and 3 are backwards.

On page 5, line 25 "element 2" should be --element 3--.

On page 8, line 2 "figure 3" should be --figure 4--.

On page 8, line 13 "quoted cables 7. the quoted connectors" should be --electric cables 7, the connectors--.

On page 12, line 12 "manoeuvre" should be --maneuver--.

Appropriate correction is required.

***Claim Objections***

4. Claim 4 is objected to because of the following informalities:

Line 1 "couplet" should be --coupled--.

Claim 8 is objected to because of the following informalities:

Line 2 "transported" should be --attached to--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Regarding claim 3, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

8. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear as to how the electrical power supply lines are

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being provided through the controlled submarine device and therefore the claim is indefinite.

9. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claim 16 recites the limitation "the pressure balancing device" in line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 3, 8, and 9 are rejected as understood under 35 U.S.C. 102(b) as being anticipated by Schoenberg (5,166,677).

Schoenberg discloses a submarine actuator for the actuation of a submarine device comprising a container body (11) from which a drive shaft (18) projects that is suitable for inserting in a seat of the submarine device and suitable, through its rotation, for actuating the submarine device, the shaft is moved by at least one electric motor (15) arranged inside the container body and actuated by an electric control signal generated by a remote control station, characterized in that the container body comprises a box-shaped element (13), inside which at least one electric motor and the

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drive shaft area arranged, and a substantially cylindrical element (12) inside which there is an electronic control board for the at least one motor (col. 6, lines 4-54).

Regarding claim 3, the substantially cylindrical element is a hermetic container into which a pressurized gas is inserted. It is inherent that a gas is present in chamber 12 because of the electrical components.

Regarding claim 8, the power supply of the at least one electric motor can be carried out through a suitable power supply cable (30) transported by the remote control station to the submarine actuator.

Regarding claim 9, the electrical power supply of the at least one electric motor can be directly obtained from the electrical power supply lines (wires from 15 to 27 to 25 and 26) associated with the controlled submarine device.

13. Claims 10-13 and 18-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Johansen et al. (6,595,487).

Johansen et al. disclose a system comprising a submersible actuator (1) comprising a first housing (area that encloses the motors) having an electric motor (7 and 8) disposed in a first fluid (col. 5, lines 54-56); and a second housing (area that encloses the control components) having a control circuit disposed in a second fluid (air), wherein the second fluid is different from the first fluid, the control circuit is coupled to the electric motor, and the control circuit is configured to communicate with the remote control station (col. 5, line 27 to col. 7, line 17).



Regarding claim 11, wherein the second fluid is a pressurized gas would be inherent in an electrical enclosure otherwise the electrical components would short circuit.

Regarding claims 12 and 13, the claim is clearly anticipated by the reference.

Regarding claim 15, a pressure balancing device coupled to the submersible actuator and configured to balance internal and external pressures (col. 5, lines 54-56).

Regarding claims 18 and 19, the system comprising a flow control mechanism (2) coupled to the submersible actuator.

Regarding claims 20-22, the method claims are clearly anticipated by the apparatus of Johansen et al.

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 1-3, 6-9 are rejected as understood under 35 U.S.C. 103(a) as being unpatentable over Johansen et al. (6,595,487) in view of Schoenberg (5,166,677).

Johansen et al. disclose a submarine actuator for the actuation of a submarine device comprising a container body from which a drive shaft (5) projects that is suitable for inserting in a seat of the submarine device and suitable, through its rotation, for actuating the submarine device, the shaft is moved by at least one electric motor (7 and 8) arranged inside the container body and actuated by an electric control signal

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generated by a remote control station (col. 5, line 27 to col. 7, line 17). Johansen et al. do not disclose that the container body comprises a box-shaped element, inside which at least one electric motor and the drive shaft area arranged, and a substantially cylindrical element inside which there is an electronic control board for the at least one motor. Schoenberg discloses that the container body comprises a box-shaped element (13), inside which at least one electric motor and the drive shaft area arranged, and a substantially cylindrical element (12) inside which there is an electronic control board for the at least one motor (col. 6, lines 4-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a container as disclosed by Schoenberg with the device of Johansen et al., in order to ensure that the different components are separated as indicated by Johansen et al.

Regarding claim 2, Johansen et al. disclose two motors that are suitable for moving the drive shaft independently from each other.

Regarding claim 3, the substantially cylindrical element is a hermetic container into which a pressurized gas is inserted. It is inherent that a gas is present in chamber 12 because of the electrical components.

Regarding claim 6, the drive shaft (5) completely crosses the box-shaped element and, on its upper end, a visual recognition device (3b) of the position taken up by the submarine device controlled by the movement of the drive shaft is made.

Regarding claim 7, on the upper end of the drive shaft a seat (3b) is formed for the insertion of a possible robotized arm suitable for rotating the drive shaft in an

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emergency situation in which it is not possible to actuate the drive shaft electrically as disclosed by Johansen et al.

Regarding claim 8, the power supply of the at least one electric motor can be carried out through a suitable power supply cable (15 and 16) transported by the remote control station to the submarine actuator.

Regarding claim 9, the electrical power supply of the at least one electric motor can be directly obtained from electrical power supply lines (9 and 10) associated with the controlled submarine device.

16. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johansen et al. in combination with Schoenberg as applied to claim 1 above, and further in view of Ursel et al. (WO 01/99259)(utilizing US Pat. 6,906,438 for translation).

Johansen et al. in combination with Schoenberg disclose a drive shaft (5) and that each motor is independently able to control the drive shaft. Johansen et al. fails to disclose that the transmission comprises a worm screw coupled to the transmission shaft and a sprocket coupled to the worm screw and the drive shaft, wherein the electric motors are coupled to the transmission shaft. Ursel et al. disclose a worm screw (26) coupled to a transmission shaft (25) and a sprocket (43) coupled to the worm screw and a drive shaft (col. 1, line 49 to col. 2, line 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a worm screw/sprocket drive system as disclosed by Ursel et al. as the gearing between the motors and drive shaft of Johansen et al. in combination with Schoenberg, in order to a gearing system that prevents slipping.

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17. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schoenberg in view of Armstrong (2003/0037544).

Schoenberg discloses a device for the compensation of the external pressure which is firmly connected on a side of the box-shaped element that injects pressurized oil inside it through an inlet pipeline, in order to equalize the internal pressure and the external pressure. Schoenberg does not disclose that the device for the compensation of the external pressure comprising a membrane accumulator. Armstrong discloses the use of a membrane pressure compensator (29)(col. 2, line 59 to col. 3, line 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a membrane accumulator as disclosed by Armstrong in place of the piston accumulator of Schoenberg, since the membrane accumulator of Armstrong and the piston accumulator of Schoenberg are art recognized equivalents.

18. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johansen et al. in view of Ursel et al. (WO 01/99259)(utilizing US Pat. 6,906,438 for translation).

Johansen et al. disclose a drive shaft (5) and that each motor is independently able to control the drive shaft. Johansen et al. fails to disclose that the transmission comprises a worm screw coupled to the transmission shaft and a sprocket coupled to the worm screw and the drive shaft, wherein the electric motors are coupled to the transmission shaft. Ursel et al. disclose a worm screw (26) coupled to a transmission shaft (25) and a sprocket (43) coupled to the worm screw and a drive shaft (col. 1, line 49 to col. 2, line 3).

Art Unit: 3753

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a worm screw/sprocket drive system as disclosed by Ursel et al. as the gearing between the motors and drive shaft of Johansen et al. in order to a gearing system that prevents slipping.

19. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johansen et al. in view of Schoenberg (5,166,677).

Johansen et al. disclose all the features of the claimed invention except it does not show the pressure balancing device and where it is connected to the unit, Schoenberg discloses a pressure balancing device (40) that is connected to the first housing (13)(col. 6, lines 55-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a pressure control device attached to the first housing as disclosed by Schoenberg with the device of Johansen et al., in order to be able pressurize the interior of the first housing at various depths.

20. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johansen et al.

Johansen et al. disclose all the features of the claimed invention except that the second fluid is nitrogen. The examiner is taking official notice that the use of nitrogen to create and inert atmosphere in a control circuit enclosure is old and well know in the art in order to ensure that there are no contaminants that could corrode the circuitry.

**Conclusion**

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ursel et al. (6,906,438) is the English translation that is being utilized for the WO01/99259 reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRAIG M. SCHNEIDER whose telephone number is (571)272-3607. The examiner can normally be reached on M-F 8:00 -4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Huson can be reached on (571) 272-4887. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. S./  
Examiner, Art Unit 3753  
October 24, 2008

/John Rivell/  
Primary Examiner, Art Unit 3753

AP20 Rec'd PCT/PTO 13 JUL 2006

PTO/SB/D8A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**(Use as many sheets as necessary)**

## Completely Known

Application Number	Unassigned 3753
Filing Date	July 13, 2006
First Named Inventor	Carlo Liberale
Art Unit	Unassigned 3753
Examiner Name	Unassigned Craig Schne
Attorney Docket Number	CMRN:0065/5WA (CCV/Dresser 030957 US)

Sheet	1	of	1
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## U. S. PATENT DOCUMENTS

[illegible]

## FOREIGN PATENT DOCUMENTS

[illegible]

**Examiner  
Signature**

/Craig Schneider/

Date  
Considered

10/15/2008

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

**If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.**

<b>Notice of References Cited</b>	Application/Control No. 10/586,205	Applicant(s)/Patent Under Reexamination LIBERALE ET AL.	
	Examiner CRAIG M. SCHNEIDER	Art Unit 3753	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2003/0037544	02-2003	Armstrong, John Taylor	60/413
*	B	US-6,906,438	06-2005	Ursel et al.	310/89
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

**FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	WO01/99259	12-2001	German	Ursel et al.	H02K 23/66
	O					
	P					
	Q					
	R					
	S					
	T					

**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES  
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum  
Internationales Büro



(43) Internationales Veröffentlichungsdatum  
27. Dezember 2001 (27.12.2001)

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(51) Internationale Patentklassifikation<sup>7</sup>: **H02K 23/66**,  
5/14

(71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von  
US): **ROBERT BOSCH GMBH** [DE/DE]; Postfach 30 02  
20, 70442 Stuttgart (DE).

(21) Internationales Aktenzeichen: **PCT/DE01/02314**

(22) Internationales Anmeldedatum:  
20. Juni 2001 (20.06.2001)

(72) Erfinder; und

(75) Erfinder/Anmelder (nur für US): **URSEL, Eck-  
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S-DOERFER, Robert** [DE/DE]; Breithurster Str. 8, 77833  
Ottersweier Breithurst (DE).

(25) Einreichungssprache: **Deutsch**

(26) Veröffentlichungssprache: **Deutsch**

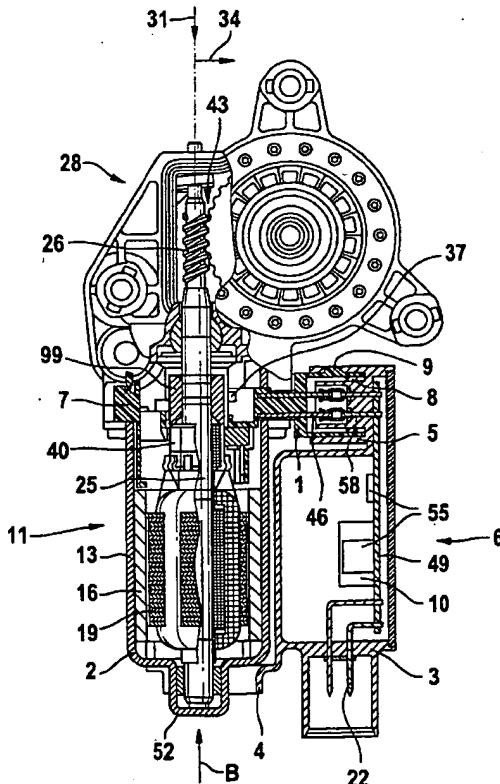
(30) Angaben zur Priorität:  
100 29 452.9 21. Juni 2000 (21.06.2000) DE  
Nicht mitgeteilt 19. Juni 2001 (19.06.2001) DE

(81) Bestimmungsstaaten (national): **AU, BR, CN, CZ, JP,  
KR, US.**

[Fortsetzung auf der nächsten Seite]

(54) Title: **ELECTRICAL DRIVE UNIT**

(54) Bezeichnung: **ELEKTRISCHE ANTRIEBSEINHEIT**



(57) Abstract: In an electrical drive unit according to prior art, a signal receiver which is arranged on a printed circuit board in an electronic housing has to be brought close to a signal transmitter, thereby requiring considerable effort. The inventive drive unit (6) comprises a sealed electronic housing (3) and a motor housing (13), the signal receiver (37) being arranged on a brush holder (7) in the housing of the motor (13) or the gearbox (28), thereby facilitating the design and construction of the printed circuit board (49).

(57) Zusammenfassung: Bei einer elektrischen Antriebseinheit nach dem Stand der Technik muss ein Signalempfänger, der auf einer Leiterplatte in einem Elektronikgehäuse angeordnet ist, in aufwendiger Weise nahe an einen Signalgeber herangeführt werden. Eine erfindungsgemäße Antriebseinheit (6) hat ein abgeschlossenes Elektronikgehäuse (3) und Motorgehäuse (13), wobei der Signalempfänger (37) am Bürstenhalter (7) im Motorgehäuse (13) oder Getriebegehäuse (28) angeordnet ist. Der Aufbau einer Leiterplatte (49) ist deshalb einfach zu gestalten.

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(84) Bestimmungsstaaten (*regional*): europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

*Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.*

**Veröffentlicht:**

- mit internationalem Recherchenbericht
- vor Ablauf der für Änderungen der Ansprüche geltenden Frist; Veröffentlichung wird wiederholt, falls Änderungen eintreffen

5

10      Elektrische Antriebseinheit

Stand der Technik

Die Erfindung geht aus von einer elektrischen  
15      Antriebseinheit nach der Gattung des Anspruchs 1.

Aus der EP 538 495 A1 ist ein elektromotorischer  
Fensterheberantrieb bekannt, bei dem ein Elektronikgehäuse  
auf ein Getriebegehäuse gesteckt wird. Das Elektronikgehäuse  
20      und das Getriebegehäuse sind an dieser Verbindungsstelle  
offen und müssen abgedichtet werden.

Aus der DE 198 39 333 C1 ist eine Antriebseinrichtung  
bekannt, bei der ein abgeschlossenes Elektronikgehäuse auf  
25      ein abgeschlossenes Getriebegehäuse montiert ist. Die  
Hallsensoren sind dabei auf einer Leiterplatte in dem  
Elektronikgehäuse angeordnet.

## 30      Vorteile der Erfindung

Die erfindungsgemäße elektrische Antriebseinheit mit den  
kennzeichnenden Merkmalen des Anspruchs 1 hat demgegenüber  
den Vorteil, dass auf einfache Art und Weise ein  
35      Elektronikgehäuse, das kundenspezifisch ausführbar ist, an

eine elektrische Antriebseinheit angeordnet werden kann, die zum grössten Teil aus Standardgehäusen, wie dem Motorgehäuse und dem Getriebegehäuse, aufgebaut ist.

5 Durch die in den abhängigen Ansprüchen aufgeführten Massnahmen sind vorteilhafte Weiterbildungen und Verbesserungen der im Anspruch 1 genannten Antriebseinheit möglich.

10 Das Elektronikgehäuse ist vorteilhafterweise an einem Stecker angeordnet, weil dadurch nur der Stecker den kundenspezifischen Anforderungen mit seiner Steckerform und/oder Anzahl von Steckkontakten angepasst werden muss.

15 Vorteilhafterweise verwendet man für die Signalempfänger zur Dreherkennung Hallsensoren.

Das Elektronikgehäuse kann vorteilhafterweise sowohl in radialer als auch in axialer Richtung am Stecker-  
20 Bürstenhalter befestigt werden, wodurch eine Einbaurichtung des Elektronikgehäuses den jeweiligen äusseren Umständen angepasst werden kann.

25 Zeichnung

Ein Ausführungsbeispiel der Erfindung ist in der Zeichnung vereinfacht dargestellt und in nachfolgenden Beschreibung  
näher erläutert.

30

35

Es zeigen  
Figur 1a eine teilweise geschnittene elektrische  
Antriebseinheit, und  
Figur 1b eine Aufsicht auf die erfindungsgemäss ausgebildete  
5 elektrische Antriebseinheit in Blickrichtung B der Figur 1a.

#### Beschreibung des Ausführungsbeispiels

10 Figur 1a zeigt eine erfindungsgemäss ausgebildete elektrische Antriebseinheit 6, beispielsweise für die Verwendung als Fensterhebergetriebemotor.  
Die elektrische Antriebseinheit 6 besteht zumindest aus einem Elektromotor 11, einem Getriebe 43 und einer  
15 Motorelektronik 10.  
Ein elektrischer Kommutatormotor, als ein Beispiel für einen Elektromotor 11, besteht zumindest aus einem Kommutator 40, einem Motorgehäuse 13, das beispielsweise als Polrohr oder auch als Poltopf 2 ausgebildet ist und als magnetisches  
20 Rückschlusselement dient, und am Motorgehäuse 13 angeordneten Magneten 16.  
Die elektrische Antriebseinheit 6 weist eine Rotorwelle 25 auf, die von dem Motorgehäuse 13 bis in ein Getriebegehäuse 28 hineinragt und entsprechend bspw. im Motorgehäuse 13 und  
25 im Getriebegehäuse 28 gelagert ist.  
Auf der Rotorwelle 25 im Bereich der Magneten 16 ist ein Blechpaket 19 angeordnet, auf dem eine Wicklung angeordnet ist.  
An dem dem Elektromotor 11 gegenüberliegenden axialen Ende  
30 der Rotorwelle 25 ist an der Rotorwelle 25 eine Verzahnung 26 ausgebildet, die mit einer Verzahnung des Getriebes 43 in Wechselwirkung steht.  
Das Getriebe 43 und die Verzahnung 26 sind in dem Getriebegehäuse 28 angeordnet.

Zwischen dem Motorgehäuse 13 und zumindest teilweise zwischen dem Getriebegehäuse 28 ist ein Bürstenhalter 7 angeordnet. Auf dem Bürstenhalter 7 ist zumindest ein Signalempfänger 37 zur Dreherkennung der Rotorwelle 25, 5 beispielsweise der Drehzahl oder Drehrichtung, vorhanden, beispielsweise in Form von Hallsensoren. Auf der Rotorwelle 25 ist dementsprechend ein Signalgeber bspw. in Form eines Ringmagneten 99 angeordnet.

An dem Bürstenhalter 7 ist bspw. einteilig ein Stecker 1 mit 10 Steckkontakten 46 ausgebildet, der bspw. zumindest teilweise aus dem Getriebegehäuse 28 herausragt. Die Steckkontakte 46 sind bspw. in dem Stecker 1 und weiterführend in dem Bürstenhalter 7 eingespritzt.

Das Motorgehäuse 13, der Bürstenhalter 7 und das 15 Getriebegehäuse 28 sind miteinander verbunden, d.h. sie sind dicht aneinander angeordnet und deshalb wasserdicht.

Die elektrische Antriebseinheit 6 weist weiterhin ein dicht abgeschlossenes Elektronikgehäuse 3 auf, das einem zum 20 Stecker 1 passenden Gegenstecker 5 aufweist. Mittels einer Fixiervorrichtung 9, beispielsweise in Form von Rastelementen, ist der Gegenstecker 5 des Elektronikgehäuses 3 an dem Stecker 1, der hier einteilig mit dem Bürstenhalter 7 verbunden ist, befestigt.

25 Ein Dichtelement 8 ist zwischen Stecker 1 und Gegenstecker 5 angeordnet, der die Steckkontakte 46 vor Feuchtigkeit schützt.

In dem Elektronikgehäuse 3 ist die Motorelektronik 10 30 angeordnet. Die Motorelektronik 10 besteht beispielsweise aus zumindest einer Leiterplatte 49 mit verschiedenen elektrischen und/oder elektronischen Bauelementen 55.

Die Leiterplatte 49 hat ebenfalls Steckelemente 58, die die elektrischen Steuersignale und/oder Stromversorgung an den 35 Elektromotor 11 weiterleiten.

- 5 -

Die Steckkontakte 58 sind bspw. ebenfalls in das Elektronikgehäuse 3 eingespritzt und so nach aussen wasserdicht abgeschlossen.

5 Weiterhin weist das Elektronikgehäuse 3 einen Elektronikgehäuseanschlussstecker 22 auf, der zur Verbindung nach aussen zu einer elektrischen Energieversorgung dient.

10 Das Elektronikgehäuse 3 ist in diesem Beispiel in radialer Richtung 34 an den Bürstenhalter 7 aufgesteckt worden. Der Stecker 1 am Bürstenhalter 7 kann aber auch so ausgebildet sein, dass das Elektronikgehäuse 3 in axialer Richtung 31 aufgesteckt werden kann.

15 Figur 1b zeigt eine Teilaufsicht in axialer Richtung auf die elektrische Antriebseinheit 6.

Das Elektronikgehäuse 3 weist bspw. zumindest eine Klammer 4 auf, mittels der es am axialen Ende des Motorgehäuse 13, einer Lagerbuchsenaufnahme 52, aufgesteckt und befestigt ist. Die Befestigung kann auch anders sein und bspw. auch am 20 Stecker 1 ausgebildet sein.

5

## 10 Ansprüche

1. Elektrische Antriebseinheit,  
mit einem Getriebegehäuse,  
mit einem Motorgehäuse,  
15 mit einem Elektronikgehäuse, das separat ausgebildet und  
wasserdicht abgeschlossen ist,  
mit einem Bürstenhalter,  
mit zumindest einem Signalempfänger zur Dreherkennung,  
20 dadurch gekennzeichnet, dass  
  
der zumindest eine Signalempfänger (37) am Bürstenhalter  
(7) angeordnet ist.
- 25 2. Elektrische Antriebseinheit nach Anspruch 1,  
dadurch gekennzeichnet, dass  
  
der Signalempfänger (37) ein Hallsensor ist.

30



3. Elektrische Antriebseinheit nach Anspruch 1,  
dadurch gekennzeichnet, dass

das Elektronikgehäuse (3) an einem Stecker (1) angeordnet  
ist.

5

4. Elektrische Antriebseinheit nach Anspruch 1,  
dadurch gekennzeichnet, dass

10

das Elektronikgehäuse (3) in radialer Richtung (34) an  
einem Stecker (1) befestigbar ist.

5. Elektrische Antriebseinheit nach Anspruch 1,  
dadurch gekennzeichnet, dass

15

das Elektronikgehäuse (3) in axialer Richtung (31) in  
axialer Richtung an einem Stecker (1) befestigbar ist.

20

6. Elektrische Antriebseinheit nach Anspruch 1 oder 3,  
dadurch gekennzeichnet, dass

25

der Bürstenhalter (7) Steckkontakte (46) aufweist, mit  
denen eine Elektronik (10) elektrisch verbunden ist.

7. Elektrische Antriebseinheit nach Anspruch 6,  
dadurch gekennzeichnet,

5 dass die Elektronik (10) in einem Elektronikgehäuse (3)  
angeordnet ist, und

dass das Elektronikgehäuse (3) Steckelemente (58)  
aufweist, die mit den Steckkontakten (46) elektrisch  
verbindbar ist.

10

8. Elektrische Antriebseinheit nach Anspruch 3, 4, oder 5,  
dadurch gekennzeichnet, dass

der Stecker (1) am Bürstenhalter (7) angeordnet ist.

15

1 / 1

Fig. 1a

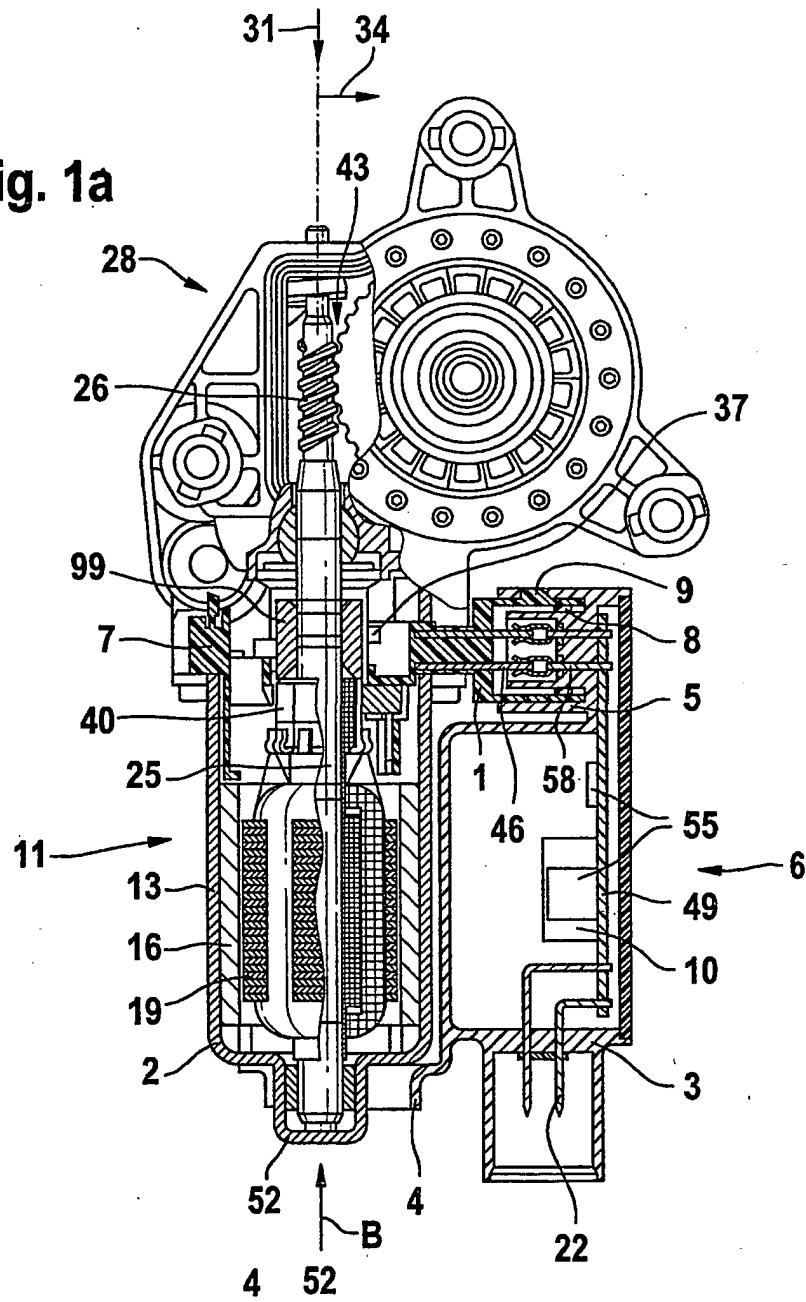
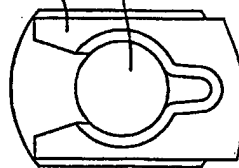


Fig. 1b



## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/DE 01/02314

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H02K23/66 H02K5/14

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H02K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 528 093 A (ADAM PETER ET AL) 18 June 1996 (1996-06-18)	1-3
Y	column 3, line 16 -column 4, line 48; figures 1-8	3-8
X	EP 0 865 148 A (BOSCH GMBH ROBERT) 16 September 1998 (1998-09-16) column 3, line 14 -column 5, line 3; figure 1	1-3
X	DE 43 37 390 A (BROSE FAHRZEUGTEILE) 27 April 1995 (1995-04-27) column 4, line 36 -column 6, line 16; figures 1,2	1,2
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## INTERNATIONAL SEARCH REPORT

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	DE 38 38 285 A (SWF AUTO ELECTRIC GMBH) 17 May 1990 (1990-05-17) column 3, line 22 -column 4, line 23; figures 1-4 -----	1-8

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## INTERNATIONALER RECHERCHENBERICHT

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PCT/DE 01/02314

A. KLASSTIFIZIERUNG DES ANMELDUNGSGEGENSTANDES  
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Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)

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Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

EPO-Internal, WPI Data

## C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X	US 5 528 093 A (ADAM PETER ET AL) 18. Juni 1996 (1996-06-18)	1-3
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X	EP 0 865 148 A (BOSCH GMBH ROBERT) 16. September 1998 (1998-09-16) Spalte 3, Zeile 14 - Spalte 5, Zeile 3; Abbildung 1	1-3
X	DE 43 37 390 A (BROSE FAHRZEUGTEILE) 27. April 1995 (1995-04-27) Spalte 4, Zeile 36 - Spalte 6, Zeile 16; Abbildungen 1,2	1,2

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Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen



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Bevollmächtigter Beauftragter

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## INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/DE 01/02314

## C.(Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
Y	DE 197 10 015 A (BOSCH GMBH ROBERT) 17. September 1998 (1998-09-17) Spalte 4, Zeile 12 -Spalte 4, Zeile 66; Abbildungen 1-4 _____	3-8
A	DE 38 38 285 A (SWF AUTO ELECTRIC GMBH) 17. Mai 1990 (1990-05-17) Spalte 3, Zeile 22 -Spalte 4, Zeile 23; Abbildungen 1-4 _____	1-8



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Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen

PCT/DE 01/02314

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